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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/473,495	12/28/1999	TETSUYA ATSUMI	M2009-13	1052

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EXAMINER	
FISCHER, JUSTIN R	

ART UNIT	PAPER NUMBER
1733	21

DATE MAILED: 07/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/473,495	ATSUMI ET AL.	
	Examiner	Art Unit	
	Justin R Fischer	1733	

-- Th MAILING DATE of this communication appears on th cov r sh et with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson (US 3,466,610, of record) in view of Sugiyama (JP 08131588, of record), Kusomoto (US 6,106,413, of record), Akatsuka (US 5,156,396, newly cited), the Admitted Prior Art (Page 1, Lines 18-25), Lauraitis (US 4,000,896, of record), and Van Auken (US 4,023,801, of record). As best depicted in Figure 17, Jackson discloses a method of making a golf club shaft comprising a first angled layer (62'), a first straight layer (66'), a second angled layer (68'), and a second straight layer (72'). The reference, however, fails to include an innermost, first reinforcement layer and an outer, second reinforcement layer and further fails to expressly describe the layers as being applied in sheet form (as opposed to a filament winding technique). Regarding the first (innermost) reinforcement layer, Sugiyama is directed to a golf club shaft in which a first reinforcement layer formed of perpendicular reinforcing elements is specifically disposed inside a straight layer in order to prevent separation and optimize flexural rigidity (Abstract). Thus, it would have been obvious to include a first reinforcement layer in the shaft of Jackson in view of Sugiyama to obtain the aforementioned benefits, it being emphasized that the first reinforcement layer is specifically designed to be

included adjacent a parallel reinforcement layer, as is contained in Jackson. With respect to the second reinforcement layer, it would have been obvious to one of ordinary skill in the art at the time of the invention to include such a layer in the assembly of Jackson since such layers are commonly used to reinforce the end portion of golf club shafts in an analogous manner to that required by the claimed invention (depicted in Figure 5 by applicant), as shown for example by Kusomoto '413. Regarding the application of the respective layers, (i) Akatsuka '783 (Column 2, Lines 48+) describes the common use of filament winding and sheet winding (prepeg) to form golf club shafts and (ii) the Admitted Prior Art discloses the conventional use of wrapping individual prepeg layers from sheet form to form golf club shafts, suggesting that filament and sheet (prepeg) winding are recognized alternatives in the golf art and as such, one of ordinary skill in the art at the time of the invention would have found it obvious to apply the reinforcement layers of Jackson via a sheet or prepeg winding technique. Additionally, with respect to the formation of the angled layers, the Admitted Prior Art discloses the conventional use of bonding individual prepeg layers to form angled layers. Lastly, Lauraitis (Column 1, Lines 60-65) and Van Auken (Column 3, Lines 59-65) are applied to evidence the well-known sheet thickness of prepeg layers in the golf club industry.

The golf club shaft of Jackson, as depicted in Figure 17, contains a first angled layer, a first straight layer, a second angled layer, and a second straight layer. It should be noted that an additional reinforcement layer or straight layer (60') is also present in this embodiment. Although Jackson does not specifically describe a first and second reinforcement layer, the reference does state, "other and additional layers could be

incorporated into the shaft" (Column 2, Lines 60-62). Thus, in view of Jackson and conventional golf club shaft technology, one of ordinary skill in the art at the time of the invention would have been motivated to include a first and second reinforcement layer, as previously mentioned. In particular, Sugiyama describes the benefits of optimized flexural rigidity and decreased separation when a first reinforcement layer is positioned inward and adjacent an innermost straight layer, which is the exact configuration of Jackson. Also, the use of a second reinforcement layer to define an outermost layer is extremely well known and conventional, it being noted that Kusomoto and the applicant describe the same second reinforcement layer in the grip portion to reinforce the end portions.

Regarding the application of the fiber reinforcing layers, Akatsuka '783 and the Admitted Prior Art expressly state that filament winding and sheet (prepeg) winding techniques are extensively used in the golf club industry. One of ordinary skill in the art at the time of the invention would have been particularly motivated to use the sheet winding technique in constructing the shaft of Jackson because it eliminates the complicated processing normally associated with spiral winding or interlacing/braiding.

With respect to the angle of the second angled layer, it is evident from Figure 17 that the angled layers of Jackson (62' and 68') are defined by the intersection of fiber materials at a large angle (appears to be roughly 90°). Furthermore, one of ordinary skill in the art at the time of the invention would have readily appreciated the range of the claimed invention (70°-150°) as being broad and conventional, as further evidenced by Akatsuka '396 (Column 2, Lines 20-36).

Regarding claim 20, applicant requires that the golf club shaft have a weight between 30 and 40 grams. One of ordinary skill in the art at the time of the invention would have recognized that the weight of a golf club shaft is dependent on several factors, including the length of the shaft (what club), the fibers and resin used to form the prepeg layers, the number of reinforcing layers used, and the type of shaft (man, woman, senior). The range of the claimed invention defines well-known golf club shaft weights that would have been readily appreciated by one of ordinary skill in the art at the time of the invention. For example, the golf club shaft of Akatsuka '396, which has a similar layer arrangement to Jackson and the claimed invention, has a weight between 5 and 63 grams (Column 4, Lines 42-45). Thus, depending on the aforementioned factors, it would have been within the purview of one of ordinary skill in the art at the time of the invention to form the shaft of Jackson with a weight between 30 and 40 grams as this range is consistent with the weights of common golf club shafts.

Also, Jackson suggests that the layered assembly is cured in a heating tunnel or curing oven (Column 3, Lines 5-15), after which it would be removed from the mandrel and trimmed as needed. The technique of trimming represents one of several, conventional post curing treatments/steps that is commonly used in the manufacture of golf club shafts.

3. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng (US 5,720,671, newly cited) and further in view of Sugiyama, Yoshida (JP 09140839, newly cited), Kusomoto (JP 09266966, newly cited), Akatsuka (US 5,685,783, newly cited), Kusomoto '413, the Admitted Prior Art, Lauraitis, and Van Auken. Cheng discloses a method for making a golf club shaft comprising the steps of

(a) forming a base rod section (on the mandrel) and (b) forming a hosel section over said base rod section. In describing the base rod and hosel sections, Cheng suggests the use of the same arrangement in each section and describes an example in which each section is formed of a first, inner angled layer and a second, outer straight layer (Figures 2 and 3 and Column 3, Lines 1-29). Thus, Cheng positively discloses a golf club having the following arrangement: first angled layer (base rod), first straight layer (base rod), second angled layer (hosel), and second straight layer (hosel). The reference, however, fails to suggest a first and second reinforcement layer to define an innermost and outermost layer and further fails to expressly describe the angled layers as being bonded together prior to being wrapped. Regarding the first (innermost) reinforcement layer, such a layer formed of perpendicular reinforcing elements is extensively arranged as the innermost layer of a large number of golf club shaft assemblies depending on the desired bending characteristics (perpendicular layers are known to increase rigidity), as shown for example by Sugiyama, Yoshida, Kusomoto '966, and Akatsuka '783. In particular, Yoshida, Kusomoto '966, and Akatsuka '783 dispose a first reinforcement layer directly inside and adjacent a first angled layer (same construction as Cheng). One of ordinary skill in the art at the time of the invention would have found it obvious to include an innermost perpendicular or hoop reinforcing layer in the shaft construction of Cheng in light of the well recognized use of such reinforcing layers in a plurality of golf shaft constructions to obtain desired bending characteristics. With respect to the second reinforcing layer, it would have been obvious to one of ordinary skill in the art at the time of the invention to include such a layer in the assembly of Cheng since such layers are commonly used to reinforce the

end portion of golf club shafts in an analogous manner to that required by the claimed invention (depicted in Figure 5 by applicant), as shown for example by Kusomoto. Regarding the formation of the angled layers, while Cheng discloses the application of the individual sheets or prepegs to form the angled layers, the Admitted Prior Art discloses the well known and conventional technique of bonding individual prepegs to form an angled layer prior to wrapping and as such, it would have been obvious to bond the individual prepegs or sheets of Cheng prior to wrapping around the mandrel (represents a recognized alternative in the golf club shaft industry). Lastly, Lauraitis (Column 1, Lines 60-65) and Van Auken (Column 3, Lines 59-65) are applied to evidence the well-known sheet thickness of prepeg layers in the golf club industry.

Regarding the angle formed by the reinforcing elements of the second angled layer, Cheng suggests that each layer contain reinforcing elements having an inclination angle between 30 and 90 degrees, which defines a relevant angle between 60 and 180 degrees and incorporates the entire range of the claimed invention.

Also, Cheng suggests that the layered assembly is cured (Column 4, Lines 1-6), after which it would be removed from the mandrel and trimmed as needed. The technique of trimming represents one of several, conventional post curing treatments/steps that is commonly used in the manufacture of golf club shafts.

With respect to claim 20, Cheng states that the inventive golf club shaft "is lighter than conventional golf club shafts having the same structural rigidity" (Column 1, Lines 50-60) and "the substantial majority of the rod remains relatively thin and lightweight" (Column 2, Lines 1-7). Thus, it is clearly evident that Cheng is directed to a lightweight golf club shaft and while Cheng fails to expressly describe a shaft weight between 30

and 40 grams, such a shaft weight represents well-known and conventional golf club shafts. The range of the claimed invention is consistent with shaft weights for several, modern day golf club shafts. In addition, one of ordinary skill in the art at the time of the invention would have recognized that the weight of a golf club shaft is dependent on several factors, including the length of the shaft (what club), the fibers and resin used to form the prepeg layers, the number of reinforcing layers used, and the type of shaft (man, woman, senior). As such, a shaft weight between 30 and 40 grams would have been readily appreciated by one of ordinary skill in the art at the time of the invention.

Response to Arguments

4. Applicant contends that Jackson, which contains spirally wound/braided reinforcement layers, discloses a preferred embodiment in which the shaft has a weight of 140.9 grams while claim 20 requires a shaft weight between 30 and 40 grams. As set forth in the rejection above, the range of 30-40 grams is consistent with well known golf shaft weights, as shown for example by Akatsuka, and furthermore, the weight of a golf club shaft is dependent on several factors, including the length of the shaft (what club), the fibers and resin used to form the prepeg layers, the number of reinforcing layers used, and the type of shaft (man, woman, senior). As such, one of ordinary skill in the art at the time of the invention would have readily appreciated the shaft of Jackson being formed via a sheet or prepeg winding technique, in view of the Admitted Prior Art, and having a shaft weight between 30 and 40 grams.

Regarding applicant's contention that Jackson is not an FRP (fiber reinforced plastic), both the Admitted Prior Art and Akatsuka evidence that filament winding and sheet or prepeg winding are recognized alternatives in the golf club shaft industry, it

being emphasized that sheet or prepeg winding eliminates the complicated processing normally associated with spiral winding or interlacing/braiding. Thus, it would have been obvious to form the shaft of Jackson using fiber reinforced plastics (FRP), as is commonly done in the manufacturing of modern day golf club shafts. Also, it is noted that none of the prior art references of record that are formed as FRP shafts include chopped fibers or filaments, suggesting that it is not necessary to include such reinforcing elements when forming a shaft in this manner, as opposed to spirally winding or braiding.

With respect to the first reinforcement layer, claims 20 and 21 do not exclude the inclusion of a straight reinforcing layer between the first reinforcement layer and the first straight layer. On the other hand, claim 22 does require that the first reinforcing layer is directly wrapped against the first angled layer and as such, a new rejection using Cheng has been set forth above. Also, while Sugiyama describes the importance of placing a first reinforcing layer adjacent and inward of a straight layer, Sugiyama, Yoshida, Kusomoto '966, and Akatsuka '783 clearly evidence that such a reinforcing layers is extensively arranged as the innermost layer and directly adjacent a first angled layer. The references as a whole suggest that one of ordinary skill in the art at the time of the invention would have found obvious to include such a first reinforcing layer depending on the desired bending characteristics (hoop layers add rigidity).

Lastly, Jackson discloses a golf club shaft having a specific order of reinforcing layers to provide the desired size, weight, flexibility, and torsional strength resistance to collapse or fracture. In this instance, Figure 17 discloses a preferred shaft assembly having the following core assembly: a first angled layer, a first straight layer, a second

angled layer, and a second straight layer. The aforementioned properties are primarily obtained by forming this specific construction, which is independent of the use of individual filaments/strands or sheets/prepegs. One of ordinary skill in the art at the time of the invention would have recognized that the layering construction of Jackson was applicable to additional, well-known application methods, such as sheet or prepeg winding. Additionally, while the shaft of Jackson includes chopped fibers, it is recognized that FRP shafts are not formed with such reinforcing elements and a fair reading of Jackson does not suggest that alternative layering means (sheet or prepeg winding) would not result in the desired size, weight, flexibility, and torsional strength resistance to collapse or fracture. As such, one of ordinary skill in the art at the time of the invention would have found it obvious to construct a shaft using the layering arrangement of Jackson, wherein the layers are formed via a sheet or prepeg winding technique as opposed to the filament winding/braiding technique employed by Jackson.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin R Fischer whose telephone number is (703) 605-4397. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Justin Fischer

July 24, 2003

Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700